GrummanWorld

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Closing In: Winner of CASS Competition To Be Announced Later This Month By Navy

MELVILLE, Long Island — Grummanites in Integrated Logistics Support here are enjoying a breather, but they hope it's short-lived. By December 16, the Navy is expected to announce the winner of the full scale development contract for its Consolidated Automated Support System (CASS).

A few weeks ago, Grumman made its best and final offer for the next phases of CASS, the Navy's next generation automatic test system. Grumman, teamed with General Dynamics Electronics Division, has been working since last August under a $3.5 million pre-full scale development contract. Both companies have also invested their own money in the program. The Grumman team is competing against a General Electric team, which also had a pre-full scale development contract.

At the peak of the proposal effort, over 300 people were working on the Grumman/General Dynamics CASS team. To describe the amount of work that went into this proposal, just the cost section encompassed over 10,000 pages.

"We were working seven days a week for a long time," says Jim Reed, CASS program vice president. "A lot of people have gone on well-earned vacations. If we win the contract, we'll be back to the same hectic schedule. The contract would begin in March."

Grumman Aircraft Systems Division has been the prime contractor on CASS, with General Dynamics and Grumman Electronics Systems Division as major subcontractors. Contraves, a subsidiary of a Swiss firm, recently signed on as a subcontractor.

Aiming For A Winner. *Tom Oliveri, test program sets manager, runs an E-2C test program on the Grumman CASS technology demonstrator for field representatives. (Photo by Bob Settles)*

CASS will be a big undertaking — estimates of eventual production contracts are in the $1 to $3 billion range. The system is being designed to debug the electronics of every Navy weapon system — initially, aircraft electronics, but eventually it will handle marine and small ship equipment as well.

"One of the big problems on an aircraft carrier is that with the array of electronics aboard, there are a lot of unique test stations," says Reed. "With all these ATEs, they're running out of space. The problem is even worse on smaller ships.

"The variety of ATEs also makes for uneven workloads. One particular ATE, and the technician trained to operate it, will be busy all the time, while another ATE gathers dust. In the past, the Navy hasn't been able to do much about that."

With Grumman's CASS, five types of test stations would handle the workload of 95 types of current equipment. The five stations share the same core electronics, and are highly bus-oriented. This enables one type of station to be easily reconfigured to perform the function of another. In addition, a portable version would go aboard small ships and a suitcase-sized one would go out to the weapon system for trouble shooting.

More important, the five stations and two portable testers can all use the same test program sets. These are the complex software programs that enable a tester to handle a particular electronic system.

The Navy asked the two CASS teams to submit designs that would meet the requirements of 1992 electronic systems. The modular design also makes it easy to upgrade as even newer technologies come into use.

The Grumman-led CASS team had its critical design review in Building 106, Melville, November 3-7. The GE team had its critical design review a week earlier. "We feel we have an advantage in that the GE team is proposing, in their words, a revolutionary approach," says Vic Bloom, deputy program director for development. "Our approach meets the need while involving less risk."

Grumman's CASS design shares design concepts with the Intermediate Forward Test Equipment (IFTE), the Army's new ATE. Grumman is already working on a full scale development contract for IFTE. "There's a lot of interest in the DoD in commonality between the branches of service," notes Bloom. "We are showing some technical commonality between CASS and IFTE — and we see that as another big advantage."

The Navy plans to split the CASS team sometime during the production stage. "Grumman would work with General Dynamics through the full scale development stage," says Bloom. Later, the Navy would ask each to submit separate production bids — though the split might not occur within the first hardware order. It's a cost-cutting measure, and it's becoming common with defense programs.■

New Life For Old Cats. *Bernie Nasshan, an inspector for Grumman's F-14 Final Wing Assembly department in Building 3, Bethpage, inspects a Tomcat wing slat track. Some of the first Tomcats ever made are being refurbished by Grumman under the Block 60/65 Upgrade contract. Meanwhile, NASA test flights with another F-14 could lead to improved wing designs for small passenger aircraft. Story on page 3. (Photo by Bob Sagliocca)*

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Eyeing The Hawkeye. *During their visit, the Thai visitors got to tour the facilities where E-2C Hawkeyes are built. From L-R are Mark Thumb, E-2C/Singapore program manager; Air Vice Marshal Samart Sodsatit, director of operations; Air Marshall Pruangwit Hongsanan, deputy chief of staff; Group Captain Chira Achalaboon; Khun Choosakdi Chittkusol, managing director, United Machinery Company of Thailand; and Jim Berry (R), E-2C manufacturing manager.*

Grumman Gives Royal Welcome To Thailand's Air Force Officials

"International sale of E-2C Hawkeyes is an important part of Grumman's business," says Rolf Larson, the newly elected president of Grumman International.

From October 20 to November 7 he hosted 10 officers of the Royal Thai Air Force. They were in Bethpage taking an intense E-2C familiarization course. After studying the Hawkeye's sophisticated airborne early warning and command and control systems, they returned to Thailand to advise their commander-in-chief.

Senior Royal Thai Air Force officers joined the group during the last few days of the course to receive executive briefings, tours and demonstrations.

Grumman has already sold Hawkeyes to Egypt, Israel, Japan, and Singapore. From the time interest is first shown by a foreign government until final aircraft delivery, Grumman operates as a team.

"Grumman International takes the lead initially while drawing heavily from other Grumman resources and expertise," Larson says. "But at the appropriate time the baton is passed to the E-2C program office, and Grumman International assumes the supportive role."

Come Rain, Snow, Sleet, Or Hail

The whipping winds and sleeting snowstorms in the North or biting cold bouts of winter in the South occasionally cause Grumman building closings or delays in openings.

Grummanites can find out if their facility is open by calling special weather emergency telephone numbers. Other buildings have also made arrangements with local radio stations to announce closings.

On Long Island

Bethpage—349-9400
Bohemia, Great River and Melville—364-2266
Calverton—369-2266
Holtsville and Woodbury—364-8171

Grummanites on Long Island can also set their radio dials to: WGSM 740AM; WGBB 1240AM; WALK 1370AM; WNYG 1440AM; WGLI 1290AM; WBLI 106.1FM; WLIM 1580.

Off Long Island

Arkadelphia, Ark.—(501) 246-4561; KVRC 1240AM
Glen Arm, Md. (301) 592-7022; WFBR 1300AM
Houston, Tex.—(713) 484-2008; KTRH 740AM
Huntsville, Ala.—(205) 880-1513
Mayfield, Pa.—(717) 876-4560; WARM 590AM or WEJL 630AM
Milledgeville, Ga.—(912) 452-0586; WMBG 1450AM or WKZR 102.3FM
Montgomery, Pa.—(717) 322-4676; WILQ 105.1FM or WYLC 1050AM
Princeton, N.J.—(609) 275-2601
Salisbury, Md.—(301) 548-7800; WICO 94FM or WQHQ 105FM
Sherman. Tex—(214) 893—2481; KIKM 910AM
St. Augustine, Fla.—(904) 829-2501
Stuart, Fla.—(305) 335-9300; WRIT 92.7FM or WSTU 1450AM
Titusville, Fla.—(305) 268-8400

Annual 25-year Luncheon Slated For December 9th

This year's 25-year luncheon will be held December 9 at the Colonie Hill in Hauppauge. As announced earlier, the 1986 affair has been scaled down to a more comfortable and manageable size.

All retirees with more than 25 years of company service will continue to be invited.

In addition to the retirees, all those Grummanites celebrating 25, 30, 35, 40, and 45 years of company service in 1986 will be invited to this year's luncheon.

Starting this year, the 25-year luncheon will be run using a system similar to high school and college reunions. For example, those celebrating service milestones this year will be invited to the 1991 luncheon. The invitation list for 1987 will include all those who celebrate major service milestones next year.

Last year, over 6,500 Grummanites were invited to the annual affair. Of that amount, over 3,500 attended. By limiting the event to only retirees and those celebrating major service milestones in 1986, the invitation list has been trimmed to 4,000.

At this year's luncheon, 274 Grummanites will receive their gold 25-year watches. In 1987, that number jumps to 1,100; in 1988, 1,200; in 1989, 800; and in 1990, 1,600.

Accolade. *The Document Processing team in the Data Systems Proposal Center received the division's first Project Sterling Group Recognition award. Shown from L are Lillian Sieger; Dotty Schneider; Betty Calsetta; Gail Infante; Deanne Parsons, group leader; Bill Rizzardi, vice president, product design and development; Nilda Rosario, former group leader, who now works for Melbourne Systems; Maureen Tauby; Wes Stout, director of proposal operations; Sue Voor; Grace Vaccaro; Phyllis Parietti; Anne Milia; Anne Kelley; and Hector Del Valle, deputy director of proposal operations. (Photo by Bob Sagliocca)*

Retirees

On behalf of our fellow workers, *Grumman World* salutes the following Grummanites for their contributions to the company and wishes them well in their retirement. Those who have recently retired are:

June Cashman (105), Mildred Finocchio (2), Raymond C. Fong (5), Joseph B. Gogarty (24), George L. Shugarts (43), Fancher B. Wakefield (35), Thomas J. DeLaney (30), John J. Falque (43), John E. Hildebrand (7), Carl Gugliotta (244), Arthur R. Barzelay (GHQ), Francisco A. Mazzola (66), Eugene F. Baird (9), Francis J. Riley (280), Duncan Whelan (2), William H. Garing (30), Doris H. Sokoloski (GHQ), Anthony M. Gurnari (30).

Obituaries

Aguedo Matos of Tool Maintenance and Repair, Bethpage, Aircraft Systems, died October 23 at the age of 60. He had been with the company since 1963 and resided at 156 Koehl St., Massapequa Park, N.Y.

Amelia D. Musco of Business Management, Bethpage, Space Division, died October 24 at the age of 62. She had been with the company since 1969 and resided at 1 Belmart Rd., Hicksville, N.Y.

Unit Values

The Grumman Employee Investment Plan has reported the following unit values as of September 30 (compared to August 31 figures):

Equity Fund
3.622 down from 3.774

Fixed Income Fund
5.550 down from 5.600

Guaranteed Income Fund
2.343 up from 2.322

Company Stock Fund
$24.125 down from $25.625

Note: It usually takes several weeks to formulate these values. EIP members can call Ext. (111) 54400 (outside Grumman, call 516-575-4400) for a recorded message which is made as soon as the new unit values are available.

Tomcat Shines In NASA Airflow Experiments

EDWARDS A.F.B., California — The F-14 Tomcat doesn't have much in common with the Boeing 737. But test flights here with a specially equipped F-14 could lead to improved wing designs for small passenger aircraft like the 737.

The tests are being conducted by NASA at its Ames-Dryden Flight Research Facility at Edwards. NASA Langley Research Center in Hampton, Virginia, is jointly involved in the project. Grumman is providing engineering and logistic support.

A "glove" has been installed over the leading edge and top of the F-14's left wing, in which sensors and meters are imbedded to gather data on smooth or laminar airflow. Previous research has shown that laminar flow wing designs can reduce aerodynamic drag 25 to 40 percent, and provide significant fuel savings.

"Most aircraft wings are designed for turbulent, rather than laminar, airflow," says Jennifer Baer-Riedhart, NASA's program manager. To explain the two phenomena, Baer-Riedhart describes a lit cigarette: smoke first flows straight, then becomes curly or turbulent.

In the same fashion, airflow over a plane's wings starts out smooth and suddenly becomes turbulent. Identifying where that occurs is crucial to improving laminar flow wing design.

"There's a need in aviation for more efficient transport aircraft," says Baer-Riedhart. "Industry needs to develop the technology of laminar flow further, and these tests provide industry with a better database. The data will help engineers to design future aircraft wings that maximize laminar flow.

"The F-14 was chosen for the test program because of its variable wing sweep," she says. "We vary the wing sweep and watch for boundary layer transition results."

Purr-fect Fit. *This F-14 Tomcat is involved in a NASA flight test program to measure laminar, or smooth, airflow over wings. A specially designed glove contains sensors that provide real-time measurements. The data will help designers improve aerodynamics in future aircraft.*

The glove is made from 1/2-inch-thick fiberglass/foam composite. Two different gloves will be used, each with a different leading edge to produce different laminar flow results.

Since the program began in March, the specially equipped Tomcat has taken about 35 test flights at speeds averaging .7 to .8 Mach. Two NASA pilots are flying the F-14: Ed Schneider and Einar Enevoldson. Real-time flight test data is transmitted to a NASA telemetry station on the ground.

"We've had excellent results so far," says Baer-Riedhart. "We've been able to determine the transition location between laminar and turbulent flow, and we've retained natural laminar flow at higher wing sweep angles than predicted."

Also involved in the program is a Lockheed JetStar business plane. Whereas the F-14 is being flown to evaluate natural laminar airflow, the JetStar has been used to measure the effects of two experimental laminar flow control devices.

Sometime this month, the aircraft will be grounded to prepare for the second phase of the flight test program. That gets underway next month. For the remainder of the test program, both wings will be covered.

Eventually, the aircraft will take another 35 to 40 test flights. The flight schedule wraps up in July, and the plane will be turned over to the Navy for the Block 60/65 upgrade.■

Blood Ties. *The 1987 Grumman Blood Program team was announced at the Long Island Blood Services Headquarters in Melville on November 13. The 1987 team hopes Grummanites will exceed this year's total donations, which are already over 11,000 pints of blood. Peter Goldsmith (L), 1986 program director; and Gerry Sandler, Data Systems senior vice president and 1986 program chairman, congratulate the 1987 team: Jake Bussolini, vice president of Business Operations and 1987 chairman; and Mary Lou Caminiti, 1987 director. (Photo by Marie Trimborn)*

New Grumman Firecat Is Hot Item At Exhibition

BALTIMORE, Md. — Getting to a fire is a lot safer for firefighters, thanks to the new Grumman Firecat. The pumper was unveiled at this year's Great American Firehouse Exhibition and Muster in Baltimore, Maryland.

The Firecat rear pumper offers fire companies a triple-duty vehicle: it's a fire pumper, an emergency rescue vehicle, and can carry gear to deal with hazardous materials as well.

But the big news is its enclosed cab, which protects 10 firefighters from the elements. Gone is the rear step, too — no more scenes of firefighters hanging on as they race to a fire. The stepless rear and the cab eliminate some of the excitement, but add a tall measure of safety.

Grumman Emergency Products offers the vehicle in either aluminum or steel. By putting the 1,500 gallons-per-minute pump at the rear of the Firecat chassis, Grumman was able to give it 142 cubic feet of cargo space and room to store 2,900 feet of hose.

With its extra cargo space, the Firecat can carry heavy duty rescue tools, "hazmat" (hazardous material) clothing, five air packs with spare bottles and other equipment usually found on special vehicles.

Grumman Emergency Products created a marketing stir when it introduced the new pumper.

Early the day the truck was introduced, Bill Bruns, Emergency Products' vice president-marketing, took part in a manufacturers' forum. It discussed fire truck safety features and the problems of product liability. A Grumman competitor called for industry teamwork to design rigs with fully enclosed cabs and no rear steps. Bruns had to work hard to keep from letting the cat — or, more precisely, the Firecat — out of the bag.

Industry saw a problem Bruns knew Grumman had already been solved. That afternoon, Emergency Products unveiled a firefighting vehicle that has every feature the forum called for, and then some.■

Food Drive Fills Need In Land Of Plenty

Glen Arm, Maryland, is a beautiful area. Many of the homeowners around the Grumman plant there have horses; the farms are well-tended. Things look prosperous.

On Long Island, too, the economy seems to be booming. Unemployment is one of the lowest in the nation. Jobs go begging at local fast food shops and department stores.

And yet, on Long Island; in Glen Arm; in Milledgeville, Georgia; in Tulare, California, and in most other Grumman communities there are people who need food.

It's here that individual Grummanites come to the rescue. During the company's second annual food drive, December 8-12, bins will be set up in well-trafficked areas in Grumman buildings.

"The response to last year's drive was excellent," says Bill Waas, director of strategic planning for Grumman Data Systems and coordinator of the food drive. "Overall, we collected 14,000 pounds of food — 10,000 on Long Island, and 4,000 from off Long Island. We haven't set a goal for this year's drive, but I'd like to see 20,000 pounds. That would be great."

Cans of high protein foods such as peanut butter, tuna fish, meats and soups are needed by people who are having a tough time surviving.

Soft-packaged goods such as rice and pasta should not be donated because they tend to tear open when handled and have to be discarded. "Besides, food banks can get all the rice, flour, corn meal, honey, and cheese they need — through the USDA agricultural surplus program," says Waas.

"Suffolk County did a study of people's attitudes, and found most think hunger affects less than 10 percent of the people on Long Island," Waas notes. "It's more like 20 percent. Here on Long Island, you don't have outright starvation. But there is a lot of malnutrition — especially among senior citizens and single mothers with children.

"A lot of people fall into a gap," continues Waas. "They lose their job, their unemployment runs out and welfare doesn't meet their needs. So you see a lot of families attending soup kitchens — it's not just the guy with the whiskey bottle anymore. And even with what's considered full employment in the Long Island area, there hasn't been any drop in attendance."

Long Island Cares, Inc., a non-profit food bank, supplies many hungry Long Islanders with food collected from drives such as Grumman's, as well as donations from food distributors and manufacturers, gleanings from Long Island farms, and government surplus. Many other Grumman sites will also donate their food collections to local food banks, though some go through other agencies to reach the needy.

In the month of October 1985, Long Island Cares distributed 50,000 pounds of food, excluding USDA commodities. This past October, it distributed 70,000 pounds.

"Hungry people on Long Island aren't readily visible, so few see their numbers growing," says Fran Watkins, director of the Emergency Food Coordinating Program of Suffolk, which receives food from Long Island Cares. "When I started on this program in 1977, we worked with 12 churches. Now we have 130.

"Today, we serve the working poor. They are underemployed. They make a dollar more than the limits and get no welfare, no services. They can't survive in a county where the median income for a family of four is $45,000," she says.

In Maryland, where Grumman has several sites, food collected goes to the Maryland Food Bank. This group distributes about six million pounds of food annually to about 300 soup kitchens and other such agencies.

Hunger reaches every corner of the nation. "About 20 million people go hungry in this country at some time each month," says Sheryl Cohen of Second Harvest. Second Harvest, a Chicago-based organization, gets donations from 250 national food companies and distributes it to 200 U.S. food banks. These in turn supply some 26,000 agencies.

"While poverty statistics are declining, hunger has not declined," she says. "Every one of our food banks is distributing more food this year than last.

"Second Harvest is growing at a phenomenal rate," Cohen says. "The sad part is that we grow because the need grows."

While the millions of tons of food distributed might make people think food drives like Grumman's aren't necessary, the numbers are misleading.

"We get a lot of baked goods and condiments like spices and gravies," says Bayard Williams, food solicitor for the Maryland Food Bank, "but not many high protein items." Donations from food companies rarely include such high protein items, according to Long Island Cares.

Watkins says, "We like people to donate complete meals: beef stew, spaghetti and meatballs, macaroni and cheese in cans. We often get things like cake mixes. If people happen to have the eggs, they are going to eat them, not use them in mixes."

Grumman works to get food to the needy in many ways. This year the company donated $5,000 to the Interfaith Nutritional Network to buy freezers, refrigerators and other equipment for its soup kitchens.

Grumman also gave $5,000 to Second Harvest and $15,000 to Long Island Cares, in part to expand its successful "Brown Bag" program. This is a nutrition and self-help program now serving senior citizens in Oyster Bay and low-income families in Suffolk. Some of the donation will also be used for the food bank's job development program in Hempstead. This program helps single, low-income, head-of-household women who have little or no job experience.

But the most important thing Grummanites can do is donate to the food drive. If you'd like more information about the Food Drive, call Bill Waas at (516) 682-5180. ■

Where It's Going. *On Long Island, the malnourished are often a family where both parents work, yet still don't earn enough to make ends meet. The food donated by Long Islanders will be distributed to them by Long Island Cares, Inc., a food bank founded by the late Harry Chapin.*

Food Drive Needs You

Volunteers are needed as building coordinators. They hang up posters, place the food barrels in the right locations, and help get the word out.

"On Long Island, we can also use volunteers after the food collection to help sort and package the food at the Long Island Food Bank," says Waas.

If you'd like to become a volunteer, call Waas at (516) 682-5180.

Last year's off-Long Island participants included the Washington office and Grumman-CTEC in Virginia; Grumman Systems Support in Gaithersburg, Md.; Aircraft Systems plants in Glen Arm, Md., Stuart, Fla., and Milledgeville, Ga.; Grumman St. Augustine in Florida; and Grumman Technical Services in Titusville, Florida.

But any Grumman site, anywhere, can sign up. Harry Volz of the Food Drive Committee will provide advice and make pick-up arrangements with a local food bank. He can be reached at (516) 575-3933.

Ticket To A Welcomed Feast

While Grummanites are asked not to donate perishable foods, there's one delicious exception: Grumman holiday turkeys. In many Grummanites' households several people work for the company, so there's more than one turkey to cook. Some Grummanites might just like to donate their turkey to the needy.

Turkey tickets are distributed right before the holidays. "What we would like people to do is pledge to give their turkey *before* the tickets are distributed. That way, we can arrange for them to be picked up and taken to soup kitchens in time for the holiday season," says Sharon Grosser, manager - Community Support Programs.

If you'd like to donate your turkey, take a few minutes now to send your name, permanent number, department and phone number to Grosser. That will be your pledge.

Food Services, acting on these pledges, can turn over the turkeys to Grosser as soon as they arrive.

When you get your card, just forward it to Grosser, M/S A33-GHQ.

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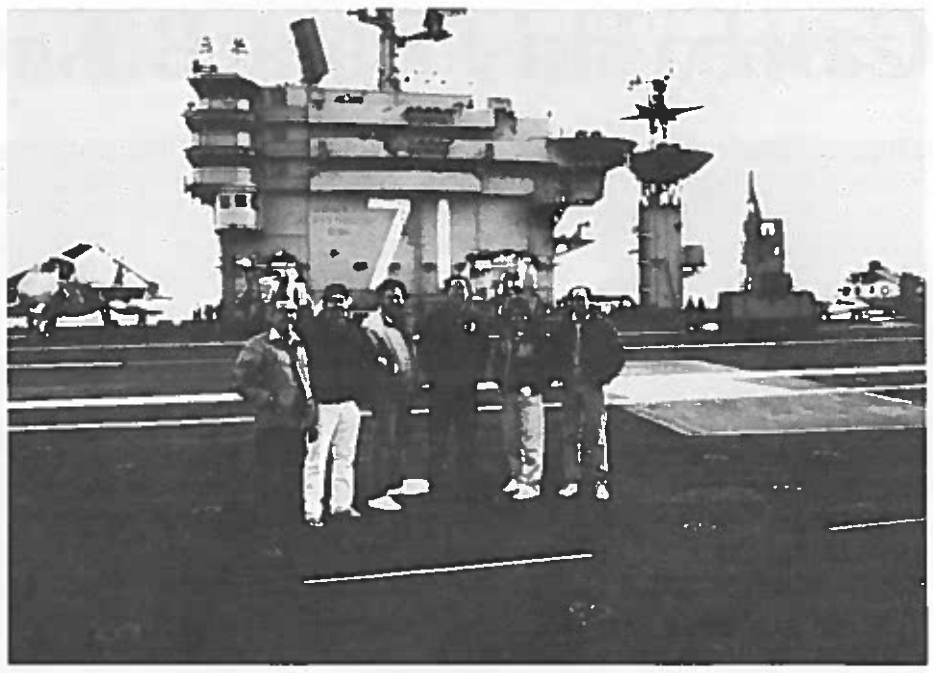
Engineers Get Their Sea Legs On U.S.S. Theodore Roosevelt

Theirs was an idyllic cruise. Far out at sea, far from the madness of quitting time and the Long Island Expressway, they viewed a clear, perfect night sky lit by a million stars. The ocean below was a magnificent blue.

But they woke each morning at 4:30 a.m. to the roaring and crashing of aircraft catapults being fired up. Still, it was a cruise that Mark Correa, Jim Eng, Mike Fusco, Stephen Green, Janet Priebe, Stephen Rauch, and Nick Soley would not have missed for the world. They spent four days at sea aboard the newly commissioned *U.S.S. Theodore Roosevelt* when it left Newport News on November 3 for catapult and arresting gear certifications.



Carrier Cruising. *Bethpage Grummanites (above) stayed aboard the U.S.S. Theodore Roosevelt to observe how company products are used in the normal workday at sea. The novice sailors are (L-R) Nick Soley, Mark Correa, Mike Fusco, Jim Eng, Janet Priebe and Stephen Rauch; Stephen Greer is not present. Fusco and Rauch (left) enjoyed spending time on deck.*

The seven F-14D program engineers are members of Grumman's F-14D cockpit working team. They collaborate with the Navy F-14D Aircrew Systems Advisory Panel, which is made up of fleet aircrews, aircrews from test and evaluation units and Navy engineers. The seven were the only Grummanites on board and among the very few ever sent aboard a carrier just to observe.

They weren't there for fun. Their mission was to see how Grumman products are used in the normal whirlwind workday at sea. No engineering course ever prepared them for what they would learn during this intense, four-day lesson.

The weather heightened the drama. While Monday was clear and crisp, it rained the remainder of the week.

"If you see a movie about carrier operations like *Top Gun* or *The Final Countdown*," says Soley, "it can't begin to make you appreciate what it's really like to watch a plane landing on deck — the noise level, the dynamics of it. You just cannot picture, from a movie, an F-14 coming in at 120 miles an hour and slamming into a deck and then stopping, just short of the edge."

Priebe recalls the contrasts. "A carrier seems so huge below deck, but the flight deck seems so small," she says.

The seven Grummanites lived like the rest of the crew — up before dawn, on the job till 10 p.m., with three square meals in between.

They sat in on briefings, and watched from "vultures row" — up near the bridge — as the first aircraft landed aboard the new carrier. They observed launch crews going through their paces, and held on tight as they stood on the landing signal officer's platform — with nothing between them and the water far below but a safety net.

Even though there were no night operations, the Grummanites didn't quit with the last landing.

"In the evenings, when the aircraft were on the hangar deck, we took every opportunity to climb all over them and see what's done when they're sitting around and the maintenance crews are working with them," says Correa. "Including Brand-X," Fusco says.

Stephen Rauch, who works in human factors engineering, spent a lot of time looking at the F-18 cockpit. "We're using the same types of multifunction displays in the F-14D and I have a a better feel of how they really work."

"We had the opportunity to go into an F-18 while it was powered up and operate the displays," says Correa. "The F-14D displays are going to be improvements on the F-18, so it was good to see the functioning hardware, how it exists today and how we are going to make it better."

Once, an F-14 didn't come in just right. It hit the deck, but the arresting hook didn't grab a cable and the pilot had to bolt and go around again.

"It didn't look like it was intentional," says Fusco, whose specialty is systems design, "so later we asked the pilot what happened." The pilot had lost his angle of attack indicator and had no other source of this information to aid his landing.

"It shows you the importance of such information, how it should be presented, and why you should make something like that redundant," says Fusco. The F-14D will provide the pilot with three different indications of angle of attack information.

"I got a feeling for what the pilots are looking at when they're approaching the carrier. And that affects my job because I'm displaying information all over their windshield," says Correa, who works on display design.

Seeing the way the carrier's crews worked, and their professionalism and pride, impressed the Grummanites. "The guy who worked the arresting gear engines said he wouldn't trade his job for anything in the world," says Fusco. "He lectured us for about an hour on how the arresting gear works."

When the seven engineers left the carrier deck by helicopter on Thursday to return home, they carried back a lot of pride in what Grumman makes. "We got a lot of compliments on the Grumman products — unsolicited comments," says Soley.

The seven Grummanites also came home with a wealth of information. Says Eng, "When we sit down at these advisory panel meetings and talk about carrier operations, I'll always have in the back of my mind a picture of what it is really like." ■

A Bit Of Drilling. *Ed Sullivan drills the outer wing panel for an A-6E Intruder in Building 2, Bethpage. Before long, the new A-6F Intruder will be rolling off the production line. The first A-6F prototype is slated to fly in June of 1987. (Photo by Bob Sagliocca)*

Catch This Data Bus: Grumman Network Allow

In his 16 years in the Greek navy, Dr. Napoleon Avaneas navigated frigates in the Aegean Sea. Now, he is skipper of a crew of Bethpage Grummanites that's making waves in the field of data communications.

The six-member team has designed and built a Very High Speed Digital Communications Network, also called a data bus. The Grumman data bus can move information faster than any network known to exist.

Though designed for a specific Grumman requirement, the network may have many commercial and military uses. Universities might be interested because it can handle thousands of ports, high-tech companies because it can move information from several supercomputers. Avaneas also thinks it could become the main bus for next generation aircraft or the Space Station. Already, two companies have stated an interest in manufacturing and marketing all or part of the data bus.

The Grumman network can move data at a staggering 100 million megabits per second. One megabit is one million bits, or pieces of information.

Right now, there are four "ports," or stations, on the data bus network. These interconnect the VAX computer on the second floor of the Engineering Development Center in Bethpage with the Tandy 2000 and two other microcomputers in the team's lab on the first. In perhaps a year, the entire building will be interconnected through the network.

That will speed up data communication at the Center, but even then the data bus won't be running full speed.

Today's computers can crunch numbers at incredible speeds but they get the sweats trying to deliver messages as fast as this network can move them.

"The computers that we have today are not fast enough to take full advantage of the technology," says Avaneas. "No computer has an interface to send information that fast. When they finally get around to building such an interface for a computer, we will be there waiting."

'The computers that we have today are not fast enough to take full advantage of the technology.'

However, when Avaneas and his team took on this project three years ago, few believed it could be built.

The goal was to interconnect the labs of the Engineering Development Center, which was then under construction. These labs work together to fully simulate an aircraft in flight.

To simulate a flight, dozens of computers calculate formulas for aerodynamic loads, takeoffs, landings, maneuvers — or anything else a Grumman aircraft would do on a mission.

The problem is transferring the information fast enough. The results of those calculations had to be available immediately to other systems and computers in the building. These tremendous amounts of information would have to be manipulated and moved — and quickly. Some sort of high speed data bus was needed.

It was a monumental task. The proposed data bus was compared to the military standard 1553 data bus that was just being incorporated into all new military systems like the F-14D and the A-6F.

"You have to understand," Avaneas points out, "that the 1553 data bus works at one megabit per second and was considered very high speed. We were going one hundred times that."

Avaneas had to agree that he was navigating some murky, uncharted waters.

He needed a good crew for this expedition into the electronic unknown, so he enlisted five talented young engineers: Bob Noelsch, Camillo Musumeci, Jean Pierre LeCrew, Vinnie Giangregorio, and George Duane.

From the beginning they knew they would be pioneers. "I remember calling around to buy parts, and so little was available that I knew very few projects like this were going on," says Noelsch. "There were no set designs; no set ways of doing things."

"No paperwork," adds Vinnie Giangregorio. That did make the job easier. There was far less work-slowing documentation than required for contracts with outside customers.

The team has been working on the ground floor of the Engineering Development Center, in a bright laboratory painted in pastels and almost awash with instruments.

Today, Musumeci is working at a computer terminal, LeCrew at another. Giangregorio pores over some information at a desk.

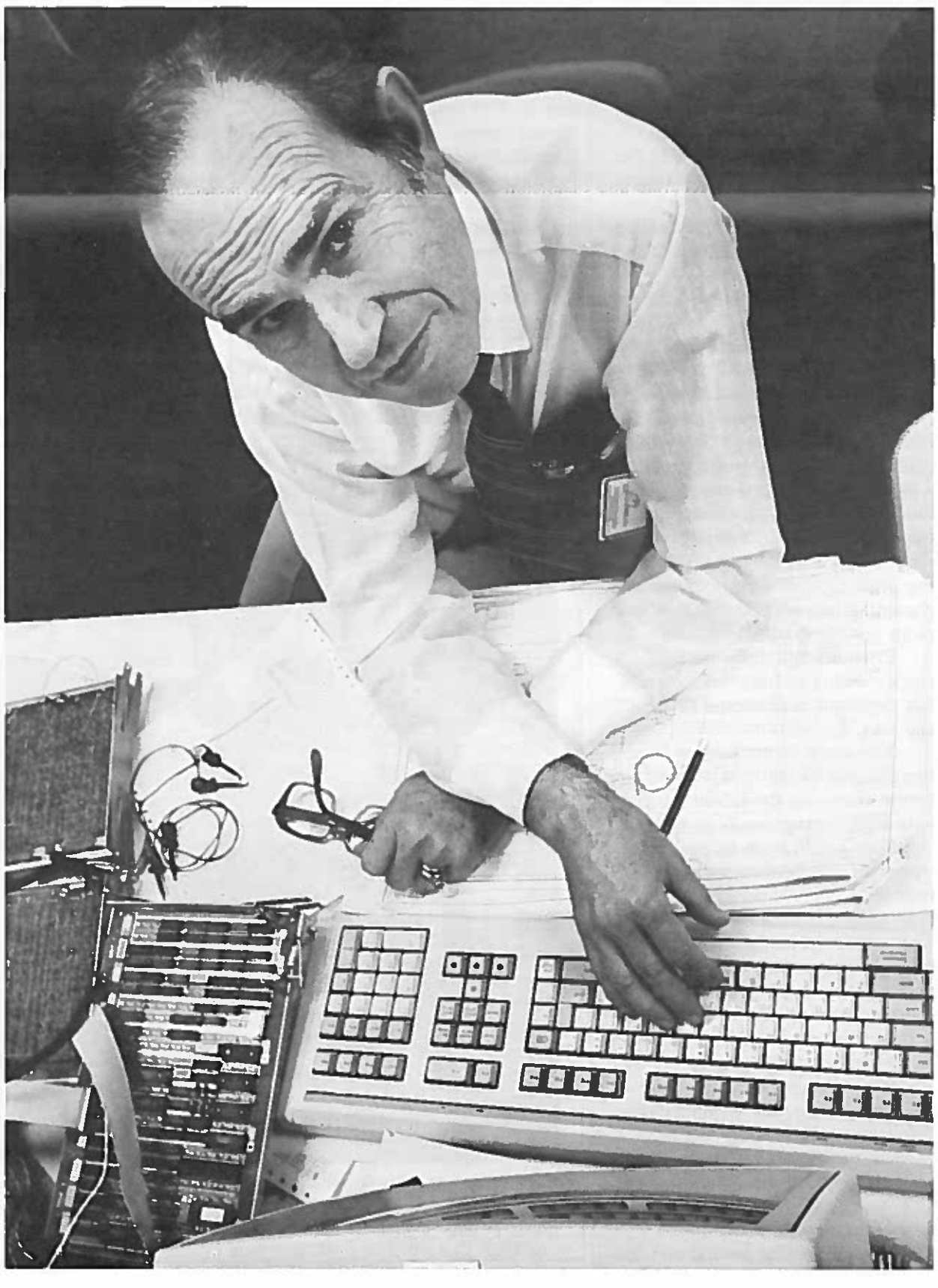
On a table in the middle of all the scopes and meters and computer terminals ringing the four walls are several "breadboards." These are the designers' prototypes of the data bus.

Each breadboard is a bit smaller than the Grumman telephone book. Each has thousands of pins sticking out from one side. Each pin is the end of a fine wire running out the other side and going only the technologists know where.

Avaneas asks a question and immediately one of the team members attacks a breadboard. He connects an alligator clip to a pin here, another to one there, then looks at the wave form that appears on an oscilloscope. Each pin means something to them, beyond the knowledge of its function. "A single part over here has four boards and each is basically the specialty of one person," says Duane.

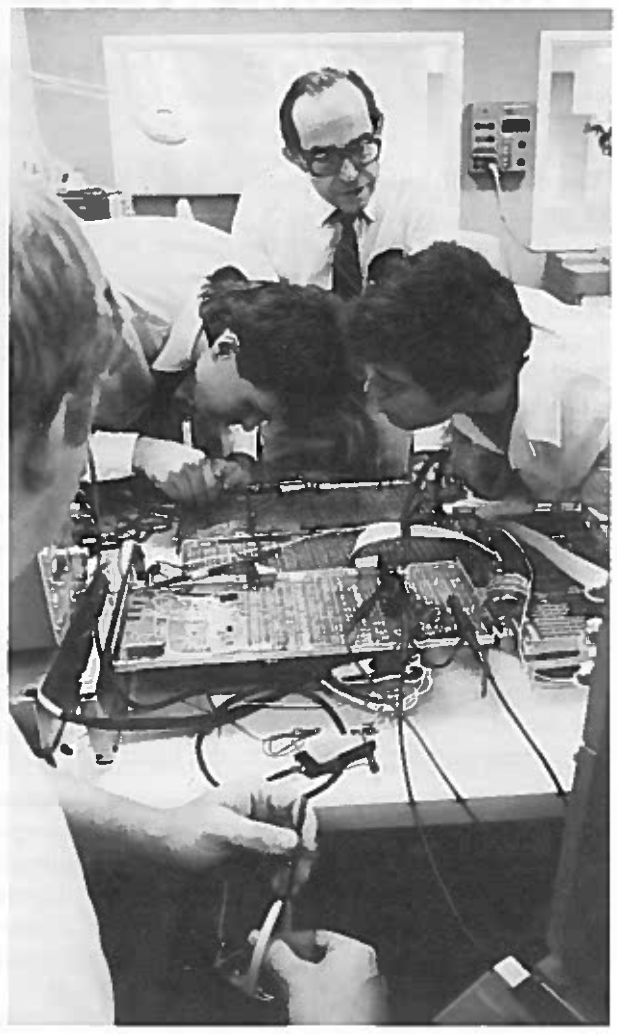
Computer companies have been exploring and installing network designs for years. And before any one was installed, its designers had to solve the same problems: Where does each message begin and end? Where is it going? When it arrives, were there any errors? How many computers can the network handle?

It's like the post office. If you don't put your letter in a properly addressed envelope, the postman can't deliver it. Computer messages need addresses, too: networks must put an



Key Player. *Dr. Napolean Avaneas had a career as an officer in the Greek Navy before becoming an electronics engineer. As a sailor functions in synch with the sea, so Avaneas works in synch with his high speed network, in which time is measured in billionths of a second. 'Now I'm living in this timing,' says Dr. Avaneas. (Photos by Bob Settles)*

s Speedier Communication Between Computers



Needle In A Haystack. *At right, George Duane (L) and Jean Pierre LeCrew make sure they attach a test probe to the right pin. There are some 13,000 wires connecting the hundreds of components in the prototype data bus. Above, Bob Noelsch was part of the effort from the beginning.*

electronic envelope around the message. They normally put a long address onto the front of the message, then tack more information onto the end to help spot errors and tell the system where the message ends.

This encoding process takes up time and space and restricts the flow of data. Avaneas and his team developed several concepts to get around this.

He feels the biggest accomplishment is the data-clock synchronization processor. With it, each receiver generates a precise timing signal for each incoming message.

The clock processor is complicated electronics but it means accurate and distortion-free reception and regeneration of messages. If the data bus transmitted 2,000 books of 1,000 pages each — with each page having 6,000 letters, punctuation marks or spaces — there would be one wrong character in the whole library.

Another big difference between this Grumman network and those built by other companies is the topology — the electronic highway system the information travels.

Most networks are set up in big circles, like traffic circles. Others are like a star, with messages coming from computers to a hub that sends them to their destinations. Plus, most networks use copper wire.

The network Avaneas and his team built is a pair of parallel rings. More important, it's a fiber-optic system. Many of the components were custom built, such as the transmitters that send the information around as pulses of light. "We had to design our own fiber-optical transmitters and receivers because they weren't available commercially when we started the project," says Avaneas.

But getting information into and around the network was also a problem. How information gets into any system is called the protocol, which is akin to rules of the road. Avaneas' team had to come up with a new protocol to handle the high speed and topology of the Grumman bus. The design: As each message enters the Grumman bus through a port, it latches onto the stream of data going around the ring as a railroad car couples to the end of a train.

'Our main goal now is to take the bus port from custom breadboard to a reproducible unit.'

Other networks let only one message travel the ring at a time. Some buses assign priorities to messages or the ports. If your information has the status of an empty boxcar, it might have trouble getting onto the network. If your data has the importance of a Metroliner heading for Washington, D.C., you could probably enter the network whenever you pleased.

That's fine for slow networks, but would only derail the high speed Grumman bus servicing a flight simulation network. The Grumman network allows many messages to travel the ring at the same time, and there is no setting of priorities. So, messages travelling the Grumman network are duplicated before entering each port. One enters and a twin continues to the next port, and so on.

Each message passes through every port, but only the message with the right destination indicator will be read by a particular port. It's complicated, but this hardwired system works. "Now we are starting to move messages," Avaneas reports.

"We have to babysit it; we have to urge it sometimes, but it works," says Duane.

Now their attention is turning to making ports for various brands of computers. "This is a universal bus," says Avaneas. In electronics language that means some months from now an engineer in the center will be able to plug in any computer that's around and get on the bus.

"Our main goal now is to take the bus port from custom breadboard to a reproducible unit," says Avaneas. "It's now made up of 13,000 wires and 800 integrated circuit chips. Miniaturization technology has made it possible to reduce all that to possibly 40 or 50 integrated circuits."

That means a complete unit would be about the size of two shoe boxes. Avaneas figures that could happen by the end of next year, depending on budget allocations.

It's taken them three years work to come this far. They've made believers out of a lot of skeptics.

"Still, the existing technology of computers is not ready for these speeds," says Avaneas.

But Grumman's network is ready and waiting.■

Inside Look. *In the hybrid high speed data bus lab in Building 14, Camillo Musumeci studies waves forms of signals moving through the network. At present there are four computers in the network.*

Mike Pelehach: *I'm Just Lucky That People Gave Me The Chance To Do The Things I Like To Do*

Mike Pelehach

You can't call Mike Pelehach a "laid back" kind of guy.

Throughout his Grumman career, he went full throttle. His enthusiasm was contagious. After a spirited conversation with him, people found themselves talking faster. A colleague once said, "Working with Mike Pelehach is like driving a golf ball in a tiled bathroom." Another said, "It's exciting — like six Roman candles exploding all at once."

On October 31, he retired as Grumman International president after a successful 36-year career.

"I'm a very fortunate man," says Pelehach. "I always had the best job in Grumman, worked with the best people and had the chance to work with top design teams. I'm the luckiest guy in the world."

After working eight years at Chance-Vought as a propulsion design engineer, Pelehach joined Grumman in 1950 as a structural design engineer. Three years later, he was tapped to join the company's prestigious preliminary design group. "That was a great thrill," says Mike. "In those days, you had to be in the company at least a billion years before you got to work in the 'snakepit.' " Designing airplanes became Pelehach's passion for the next two decades.

'In those days, you had to be in the company at least a billion years before you got to work in the snakepit.'

Recalls Dick Hutton, a retired Grumman senior vice president who headed up the group in the Fifties, "Mike possessed a great imagination. If a job needed innovative ideas, Mike would pitch in and do it — very quickly. He was an excellent guy to have on the team. In later years, he used his drive to inspire others. He didn't just assign the work and sit back. He got a lot of people to do a lot of work in a very short time. He led by example."

In the late Fifties, he was project engineer for Grumman's successful bid to build the Army Mohawks. "Mike could sling lead faster than anybody I know. He could sketch his ideas at a bewildering speed," says Bob Kress, director of Advanced Concepts-Corporate Development, who worked with Pelehach on the Mohawk and other aircraft programs.

Colleagues chuckle at the thought of Pelehach working on a computer-aided design (CAD) scope, used by today's engineers. "He'd either blow the system or he'd stick his fist through the scope during his first lesson," says Kress.

Pelehach and his design team beat out 35 other firms to win the Army Mohawk award. However, it was in the early Sixties as manager of Advanced Aircraft Systems that Pelehach really left his mark on Grumman. In that post, he directed design efforts on the F-111, EA-6A/B, E-2, C-2, A-6A, and S-2E.

"Grumman is a national asset," says Pelehach. "We have a responsibility to the U.S. government - and the taxpayers — that we spend their money the right way to build the best airplane.

"However, I always approached competition a bit differently than others," reflects Pelehach. "I looked at the Grumman family and I felt it was my job to help provide work for people so they can eat, own a home, and send the kids to college. We had to make sure we designed a better airplane than the competition — and in the process provide jobs for the Grumman family."

In 1967, he became director of Future Systems and spearheaded Grumman's winning effort that led to the F-14 contract in early 1969.

For his efforts, he was called "The Father of the Tomcat."

"Don't be ridiculous," says Pelehach. "Somebody has to be up front but nobody can do it all. Sure, I was involved with the initial concept, but there were 1,700 engineers working on the design proposal; 3,500 on the full scale design. Everybody contributed to the success of the F-14. I remember on one occasion when we needed a part in a locked warehouse in Calverton. It was two o'clock in the morning. The guard on duty didn't have a key, but he helped boost me over the wall so we could get the part."

"Mike was a ball of fire," says retired Adm. Tom Connolly, who was deputy chief of NAVAIR during the early stages of the F-14 program. "He was most accommodating and you knew what he was driving at all the time. Right from the start, he was on top of every aspect of the F-14. He led a dynamic design team.

'Everybody contributed to the success of the F-14.'

"Keep in mind that the F-14 was born in fire. The F-111B had been killed and the Tomcat had to be designed and manufactured in a very short time," adds the admiral. "Any hesitation in the schedule might well have left the program on the drawing boards. But Mike's team got the Tomcat off the boards and flying in a few short years."

Yesteryears. *In the late Sixties, Mike Pelehach spearheaded Grumman's successful effort that led to the F-14 contract. At right, Pelehach is shown with the F-14 full-scale mockup. Above, Pelehach reviews a smaller scale model of the Tomcat with Dick Hutton and Bob Mullaney.*

The early years of the Tomcat program were also trying times for Pelehach. First, there was rampant inflation which can spell disaster for any fixed-priced contract, such as the F-14. "That was the biggest scare of my career," says Pelehach. "I realized that my program could have bankrupted the company. For a while, I really thought we were going under. But I looked at the F-14 and I knew the Navy was going to get a superior fighter."

Grumman and the U.S. Navy did eventually agree to new financing arrangements, yet another blow to the program happened in 1972. "During the first flight, I was standing at the end of the runway and the plane I'd been working on for years crashed 500 yards in the woods. Thank God, both pilots made it out alive. But the accident was horrible." Colleagues say that the accident

'If I were a young engineer, I'd take at least one course in money and economics.'

only fueled Pelehach's desire to make the F-14 second to none.

In 1975, Pelehach was elected senior vice president of the Business Development Department, which was formed to stimulate new business for Grumman Aerospace. Five years later, Pelehach was elected president of Grumman International. In 1984, he was elected to the Grumman board of directors.

He calls his job at International "the most interesting part of my career. Things have been happening internationally. We are bringing in programs that will be here for years — without stretching the company's resources.

"I call these programs 'cash cows' — programs that will bring cash into the company in 1987, 1988, 1989," adds Pelehach. "And there is a real need for GII to contribute to the cash flow of the company."

These foreign contracts can also provide research-and-development funding for the U.S. military. Pelehach calls them "feedback" programs, such as the Egyptian E-2C program which entailed developing color displays for the Hawkeye.

The aircraft industry has changed dramatically during his 36-year career. "For openers, all the programs that we are going after or have won will require a lot more up-front dollars than programs did in past. It forces us to do a tremendous amount of planning.

"The big difference I see in the aerospace industry is the way decisions are made for weapons systems. Everything is driven by the money aspect.

"If I were a young engineer I'd take at least one course in money and economics. Get to know money. It's not black magic — it's very scientific. The company that wins the job is the one that has the most affordable solution.

"There will be a lot of pulling and tugging for resources over the next few years. What opportunities will the company pursue this year? How much money is needed in 1987, '88, '89? Will we have the resources to sustain a program? This whole area is something that needs to be kept in focus; it's a monumental task."

However, Pelehach is very confident that Grumman can pull it off. "Even though I've spent most of my working life at Grumman, I'm perfectly content to step aside and let the other guys take over. I have no doubt that they will do a great job."

"Grumman is in an exciting industry — an industry that I've been deeply involved in for over 40 years," says Pelehach. "I'm just lucky that people gave me the chance to do the things I like to do."■

Grummanites Invited To Join Foreign Policy Group In 1987

Want to increase your foreign policy I.Q.? Participate in the 1987 Great Decisions program at Grumman.

Participants in Great Decisions spend one evening a week discussing important world issues. It's now in its third year at Grumman. In 1986, there were about 45 Grummanites in three discussion groups.

Topics for 1987 include the Constitution and foreign policy, defense and the federal deficit, Egypt and the U.S., the Pacific Basin, South Africa, foreign investment in the U.S., Pakistan and Afghanistan, and dealing with revolution in Iran, Nicaragua, and the Philippines.

Great Decisions is a project of the Foreign Policy Association, a nonpartisan group that aims to increase citizens' understanding of and participation in foreign affairs. About 250,000 Americans participate — most Great Decisions groups are sponsored by community organizations, schools, churches, synagogues, the military, and libraries.

Two years ago, Grumman became the first corporation to sponsor a program. Since then, Texaco has started a company program, and one has been started among Exxon retirees.

Each participant receives a 96-page briefing book, which includes an in-depth article about each topic, policy views of current Administration officials and their critics, as well as suggested readings and questions for discussion. Reading is the participant's homework. Each topic is then discussed at the meeting.

Later, participants record their opinions on a ballot, which is tabulated by the Foreign Policy Association. Results are published in an annual report that gets distributed to foreign policy makers.

"Great Decisions makes you a better citizen," says Walter Schultz, a government regulations analyst for the Aircraft Systems Division. "You're better informed when you vote and write to your elected officials.

"The Foreign Policy Association selects some very timely issues for discussion," adds Schultz, who was discussion leader of his 1986 group. "It's not just an academic exercise."

"A lot of the people in my group had travelled to the places we discussed, particularly the Middle East," says Anne Burford, a contract review analyst. "That gave us an insight into the local conditions in those countries."

Burford has been involved in Great Decisions since it began. "The people in my group represented a variety of occupations and political leanings," she notes. "So that made for some very lively debates. There aren't any closed minds in this program. If you aren't willing to listen, you don't stay very long."

If you'd like to sign up for Great Decisions 1987, fill out the form on this page and send it to Grumman Recreation, mailstop A01-113.■

Great Decisions '87

Please sign me up for the '87 Great Decisions program.

Name.....Dept.....

Mail stop.....Ext.....

Mail to: Recreation, A01-113

Letters

Dear Mr. Bierwirth,

I have read your "Letter From The Chairman" in the *Grumman World* of October 24, 1986. You clearly explain the reasons for expanding Grumman's manufacturing operations away from Long Island, and reinforce the notion that technical and engineering jobs will expand on Long Island. However, I must point out that the problems forcing Grumman to move its operations elsewhere also apply to Grumman's employees.

The high cost of living on Long Island reduces disposable income to levels below that of other areas where gross salaries are much lower. Skyrocketing housing prices, including rentals, force employees to live a substantial distance from Bethpage. Congested and decaying roads are incapable of providing reasonable commuting times from areas not near Grumman. Uncontrolled development means these problems become worse on a daily basis. Unless action is taken by Grumman to alleviate these problems, the technical and engineering work force required for a high technology corporation will not be available on Long Island.

I would like to enumerate some of the policies instituted by other high technology companies to address these problems. Flextime has been instituted to allow commuting during off-peak hours. Generally, employees are required to be at work between certain hours (e.g. 10 a.m.-3 p.m.), and can arrange the remainder of the workday according to personal preference. Some companies allow a four-day, 10-hour week.

A more progressive solution is to implement telecommuting. As stated in your column, a design done on a computer can be transmitted anywhere, using standard telephone lines. The advent of the microcomputer makes it possible to supply an engineer with the tools needed to perform his job at home, with infrequent telephone links to a central site to transfer data. Many employees would be willing to buy the hardware required for telecommuting in exchange for the opportunity to work at home.

Several studies have shown that productivity and employee morale improve in a flexible work environment. I hope that Grumman has the initiative to implement these progressive policies in the near future.

Michael Holtzman
Technology Development
Aircraft Systems Division

Sales Of Grumman Models Take Off During Holidays

A Grumman model airplane may be that holiday gift that you're looking for. Here is a listing of Grumman models which can be purchased at most hobby shops.

X-29: by Hasegawa, 1/72 scale, $6.

F-14A Tomcat: by Hasegawa, 1/72 scale, $8.50 or MPC, $7; by Revell, 1/48 scale, $7.50 or Fujimi, $23 or Monogram for $7.75; by Revell, 1/32 scale, $25 or Tamiya, $70.

EA-6B Prowler: by Hasegawa, 1/72, $8.50; by MPC, 1/48, $8.

A-6A Intruder: by Hasegawa, 1/72, $6; by Fujimi, 1/48, $14.

A-6E TRAM: by Hasegawa, 1/72, $6.

E-2C Hawkeye: by Fujimi, 1/72, $12.

EF-111A Raven: by Monogram, 1/72, $5.50.

LM Lunar Module: by Monogram, 1/48, $10.

OV-1B Mohawk: by Hasegawa, 1/72, $5.50.

S2F-1 Tracker: by Hasegawa, 1/72, $10.

F11F-1 Tiger: by Hasegawa, 1/72, $5.50.

F9F-8 Cougar: by Hasegawa, 1/72, $5.50.

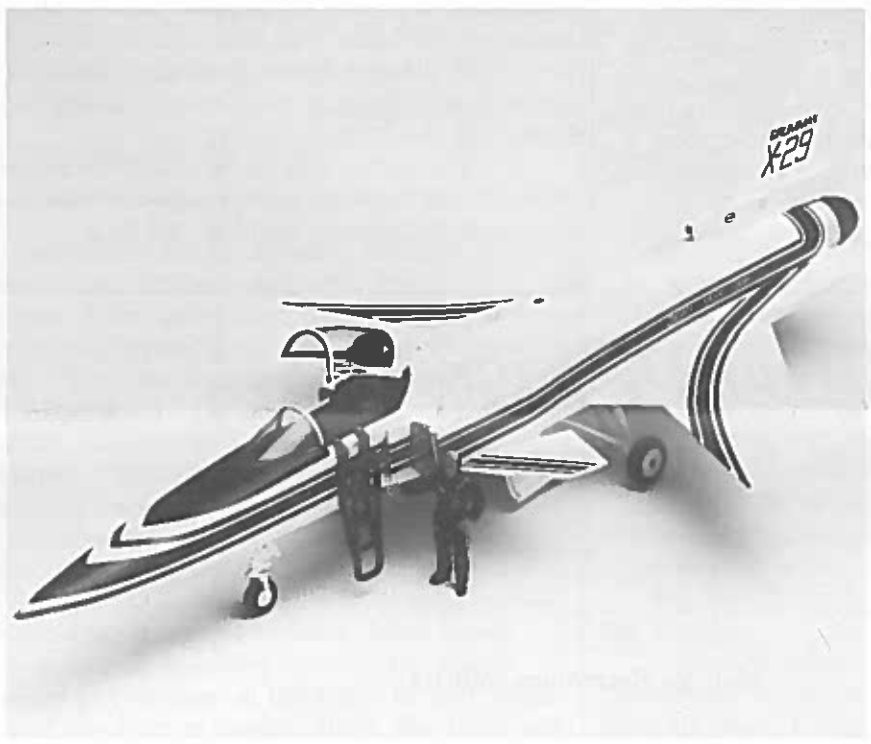
F9F-2 Panther: by Hasegawa, 1/72, $5.50.

F8F-1 Bearcat: by Testors, 1/48, $8.

F6F-3/5 Hellcat: by Hasegawa, 1/72, $3.50 or MPC, $4 or Heller, $4 or Matchbox, $3; by Hasegawa, 1/32, $30.

F4F-4 Wildcat: by Revell, 1/72, $3; by Revell, 1/32, $12.

TBF-1: by Monogram, 1/48, $5 or Lindberg, $6.50.



A Tribute To Chuck. *During the '85 holidays, Hasegawa, a Japanese model maker, introduced its Grumman X-29 model. The kit also features a miniature test pilot — namely, Grumman chief test pilot Chuck Sewell, who died in an plane crash in August. Bill Barto, assistant historian at the Grumman History Center in Bethpage, built the model (above). (Photo by Rich Breunig)*

Retiree Obituaries

Robert V. Benito of 2350 NE Ocean Blvd., Stuart, Florida, died October 28, 1986. He retired in 1977.

John T. Blixt of 701 Lake Road, Youngstown, N.Y., died October 1, 1986. He retired in 1977.

Charles W. Bowers of 255-15 149th Ave., Rosedale, N.Y., died November 5, 1986. He retired in 1971.

Robert W. Cheshire of 100 Dogwood Rd., Hendersonville, North Carolina, died October 24, 1986. He retired in 1981.

Thorer Christianson of 67 Moeller St., Hicksville, N.Y., died October 26, 1986. He retired in 1984.

John R. Corley of 105 Woodcut Dr., Mastic Beach, N.Y., died October 10,1986. He retired in 1973.

Tsun C. Fang of 17-85 215 St., Bayside, N.Y., died October 21, 1986. He retired in 1984.

Isaac H. Grant of 5 Seaman Ct., Freeport, N.Y., died October 29, 1986. He retired in 1965.

Arthur J. Katz of 4268 E. Yawepe St., Phoenix, Arizona, died October 27, 1986. He retired in 1978.

Madelyn A. Lee of 8188 SW Park Dr., Stuart, Florida, died November 10, 1986. She retired in 1984.

Frank E. Long of 69 Main St. No., Woodbury, Connecticut, died October 21, 1986. He retired in 1972.

Harold H. McLocklin of 386 Woodland Dr., Hempstead, N.Y., died October 20, 1986. He retired in 1965.

Rudolph C. Polacek of 143 Clearmeadow Dr., East Meadow, N.Y., died October 25, 1986. He retired in 1984.

Ida M. Schellinger of Shelter Island Ave., Sag Harbor, N.Y., died March 3, 1986. She retired in 1973.

Theodore Siodmak of 337D Woodbridge Dr., Ridge, N.Y., died October 29, 1986. He retired in 1976.

Alfred H. Stearns of 1204 Chase Heritage, Sterling, Virginia, died November 2, 1986. He retired in 1980.

Montana M. Turner of 315 Tressler Dr., Stuart, Florida, died October 19, 1986. He retired in 1983.

Harry Valentine Jr. at P.O. Box 26, Wardsboro, Vermont, died October 16, 1986. He retired in 1971.

Charles F. Wentzel of 42 Roosevelt Blvd., Beverly Hills, Florida, died October 28, 1986. He retired in 1971.

James T. Wilbert of 627 No. Chicot Ave., West Islip, N.Y., died November 5, 1986. He retired in 1984.

Tis' The Season For Gift Giving. *In the Employee Services Shop in Headquarters, Lynn Greco sells a Grumman tie clip to a customer. Your local ESO offers a wide selection of holiday gifts. (Photo by Bob Settles)*

Beat The Holiday Hassles: Shop At Your Local ESO

Instead of holiday trimmings, yellow stickers are plastered all over Lynn Greco's desk.

These stickers are Greco's waiting lists. With the holidays quickly approaching, people have flooded the Employee Services Office (ESO) at the Headquarters building in Bethpage with orders for merchandise.

"Why battle the holiday crunch more than you have to?" says Greco. "It's convenient to shop where you work and there are no crowds. And if we don't have an item in stock, we'll order it from our vendor or obtain it from another ESO."

Grumman Employee Services Offices offer a wide variety of reasonably priced gifts this season — from F-14 Tomcat T-shirts to 24-inch walking dolls.

"Our most popular items last year were Transformers, which are robot/car toys," says Greco. Taking their place this year are Thundercat plastic five-inch figures, derived from a cartoon show. The cartoon takes place in a futuristic world where Thundercats — half-man, half-cat characters — battle each other. "The kids can't get enough of them," she says.

Stuffed animals — from unicorns priced at $3.99 to Grumman teddy bears for $7.95 — are available at most ESO offices. Another popular children's item this year is an earthquake track system, including a remote control truck for $11.55.

"Attache cases for $27.50 and solar-powered headphone radio sets for $17.50 are selling like crazy," says Greco. "The most popular items all year 'round are Grumman T-shirts and sweatshirts, which are available in adult and children sizes. Every time we display one with a new design in the front window, we're sold out in one day." Besides the Tomcat, other T-shirt logos include the X-29, A-6F, and EA-6B.

After working in Grumman investment planning for many years, Greco joined ESO about a year ago. Her indoctrination was last year's Christmas rush on Grumman sweatshirts. "Two days before Christmas, a shipment of sweatshirts came in that many people were waiting for," says Greco. "That morning I called everyone on my waiting list. Before I knew it, the line was out the door."

Christmas candy can be ordered through ESO from a local candy maker. In addition, patches and pewter or brass belt buckles with Grumman and NASA logos make great stocking stuffers. For a small fee, the ESO salesperson will wrap your gift.

In addition to selling merchandise, ESO offices provide vehicle registration services, process film, and carry medical and travel forms. Headquarters ESO is open from 8 a.m. to 3 p.m., Monday through Friday; check with your local ESO for its hours.

Greco asks one favor of Grummanites. "Don't wait until the last minute to do your shopping," she says. "I cherish my sanity."■

Strike Up The Band!

The Grumman Employees Band will begin entertaining Grummanites the second week of December at the following Long Island sites:

Monday, December 8, Building 30.

Tuesday, December 9, Building 35.

Wednesday, December 10, Building 3.

Thursday, December 11, Building 106.

Friday, December 12, Building 6.

Monday, December 15, Building 43.

Tuesday, December 16, Building GHQ.

Wednesday, December 17, Building 2.

Thursday, December 18, Building 1.

Friday, December 19, Building 5.

All concerts take place during lunch periods.

R. M. Brill

B. J. Cecere

J. J. Cronin

R. L. Disch

J. T. Finley

J. S. Gompers

H. W. Hinton

R. A. Kliphon

Service Milestones

J. V. Murray

R. T. Nelson

B. J. Priebe

R. R. Rizzo III

S. Roberts

F. C. Towl

45

November

Armond J. Aronne, Des. Eng. Mgmt., Bethpage, Aircraft Systems
Lester N. Keller, Maint., Bethpage, Services
John P. Pomercy, Matl. Shortage Cont., Bethpage, Aircraft Systems

December

Chester C. Andrews, Mgmt., Bethpage, Aircraft Systems
Stanley C. Miron, Warehouse, Bethpage, Aircraft Systems
Louis F. Muolo, Wing Final Assembly, Bethpage, Aircraft Systems

40

November

Edward H. Best, Rec./Shipping Insp., Calverton, Aircraft Systems
James O. Roberts, Start Plan., Great River, Electronics Systems

December

Harold J. Vetter, Ctr. Sect.-Sub Assembly, Bethpage, Aircraft Systems

35

November

Leroy M. Ackerly, A-6/EA-6B Sys. Test., Calverton, Aircraft Systems
Howard N. Albert, Bldg. Protection, Bethpage, Services
Paul Birmingham, Maint. Controller, Calverton, Aircraft Systems
John C. Breimann, SE Systems Prog., Holtsville, Data Systems
Carmine Casale, Prod. Cont.- Parts Cont., Bethpage, Aircraft Systems
Ralph Falero, Assemblies, Bethpage, Aircraft Systems
Alfred E. Fischer, Paymaster, Bethpage, Services
Stephen Golego, Hydraulics, Bethpage, Aircraft Systems
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William Piero, Details, Bethpage, Aircraft Systems
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Personals

Grumman has always been a very special part of our lives. The family of Philip Vassallo would like to sincerely thank the Grumman family for their kindness and sympathy through a very difficult time in our lives. May you please continue to pray for him. **Mae Vassallo**

The kindness shown by all on the passing of my father will always be remembered. Thank you on behalf of my family. **Charles Savatteri**

On behalf of my wife and family I wish to express my sincere appreciation to Facilities Procurement, Planning & Controls, and friends for their thoughtful expressions of sympathy during our recent loss. **Francis Purstell**

I would like to thank my co-workers and friends for their kindness and support during my recent illness. Your many cards, calls and gifts were greatly appreciated. **Florence Barker**

My family and I wish to express our appreciation for the concern and kind expressions of sympathy during the illness of my husband Charles. **Joan DeBuccio**

My family and I wish to extend our deepest thanks and appreciation to all my friends and co-workers in Corporate Estimating and ESO for their kindness and sympathy after the loss of my mother. **George Saum**

I wish to thank my co-workers and ESO for their kindness during my recent convalescence. **Paul Herbst**

GrummanWorld
December 1, 1986

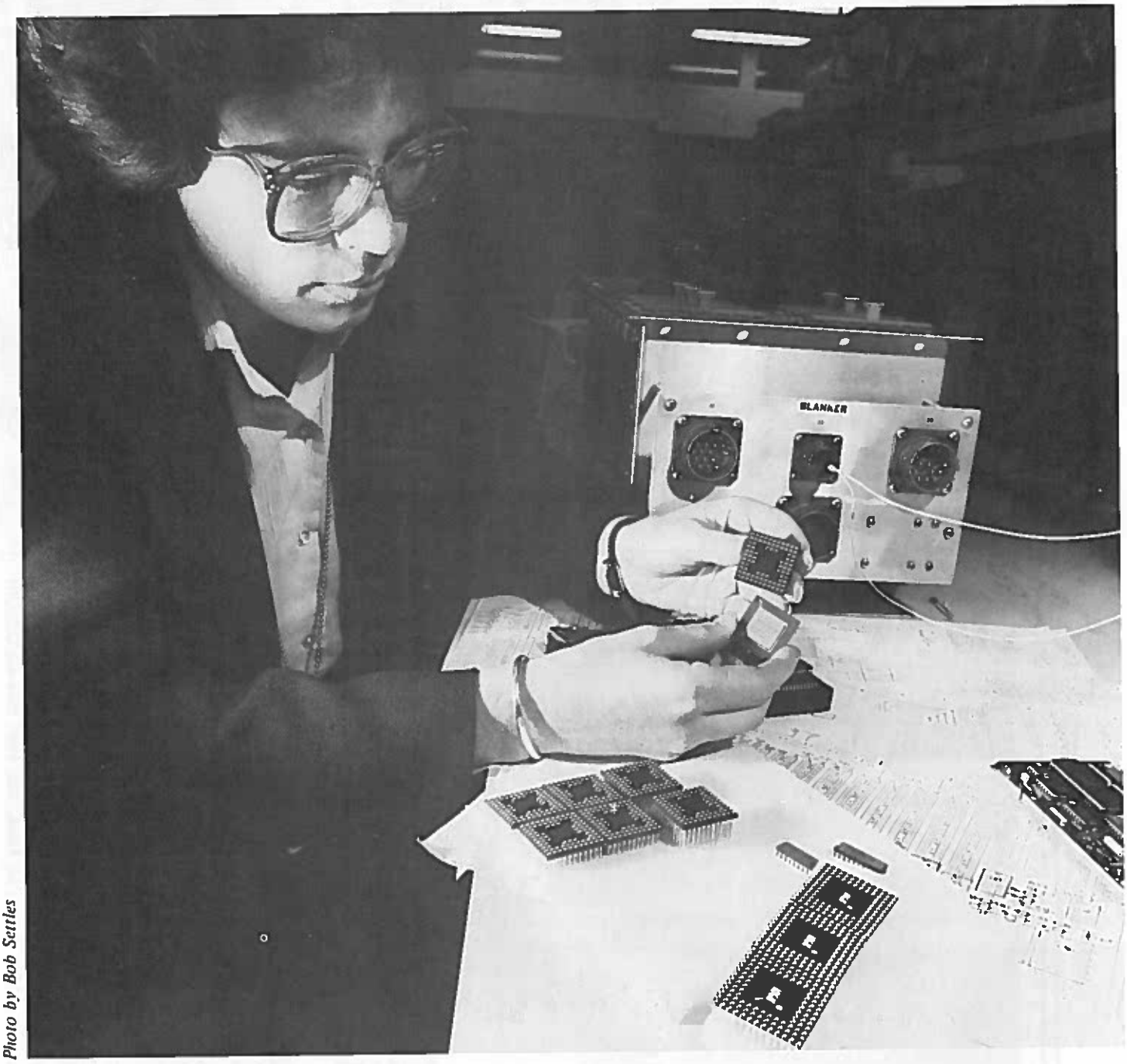


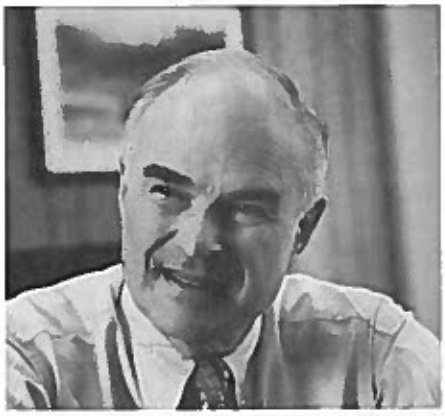
Photo by Bob Settles

On The Same Wavelength

Janet Wedgwood, design engineer in the Engineering Development Center, Bethpage, programs a gate array chip for the Adaptive Interference Blanker Unit. It will be carried aboard the F-14D and A-6F aircraft.

When the plane's transmitter and receiver are operating in the same frequency range, activating the transmitter could damage the receiver. The blanker unit prevents such interference between avionics systems by turning off or "blanking" the receiver while the tranmitter is operating. Wedgwood's program on the gate array chip will tell the unit what signals to emit to perform this blanking function.

A Letter From The Chairman



If you knew someone in school who cheated on exams and bought all his term papers, would you want to deal with him today if he came to you with a business proposition?

Of course you wouldn't. You would have a very hard time believing that his ethical standards had gotten any higher.

The same holds true for a company. Once a company's reputation is tarnished, it is hard for the public to believe that it has mended its ways.

Often, it is not one incident, one crooked deal, that hurts a company's name — but, rather, how the company responds when the wrongdoing is discovered. If a company's management tries to cover up the wrongdoing or simply looks the other way, it undermines the character of the whole organization and creates an unhealthy atmosphere. Honest people in the company come to believe that no one cares; morale and productivity suffer. Maybe, worst of all, the good people start to leave.

Each organization — whether it is a company, a government, a labor or political group — is a reflection of the policies set within it. People are more satisfied being associated with an honorable group: they work harder, they are more effective — so it is the most successful policy in the long run.

The public's perception of the defense industry is at an all-time low. Kickback schemes and misuse of funds at some companies have damaged the industry's image. To a lesser extent, we have been stung by some of that. The discovery of the overpriced ashtray was an embarrassment to Grumman, and we took great pains to set things straight: doing the right thing is a major component of our corporate culture.

Grumman is one of 35 companies to sign the Defense Industry Initiatives on Business Ethics and Conduct. Basically, the agreement underlines the procedures Grumman has always used to maintain high ethical standards. But it also compels us to spend more time training ourselves and talking about our code of ethics, and we're going to be doing that.

If you haven't received it already, you will soon get your copy of the Grumman Code of Business Conduct, which has been revised this year. It contains new information on bidding, negotiation, compliance and disciplinary action.

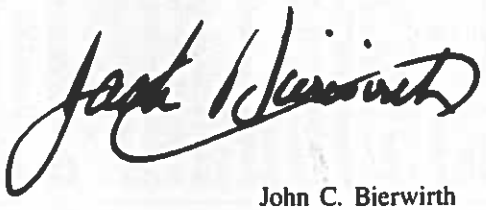
In a company of more than 30,000 people, it would be foolish to pretend that no one will ever do anything wrong. But our response must be swift and decisive wherever there is improper conduct. It should be noted, too, that the federal government has gotten tougher. For those individuals who take kickbacks on government contracts, recent legislation increases the penalty from two years in prison and a $10,000 fine to 10 years in prison and a $250,000 fine. The company will not support or assist in any way an employee who is involved in such schemes. As we point out in one of the training sessions, Grumman can't pay your fine and Grumman can't serve your time.

And it's not enough just to monitor your own actions. If you see something going on that even seems improper, you have a responsibility to speak up. Failing to do so weakens the company and compromises you, for if you are left with doubts about our real integrity, aren't you diminished by those very doubts?

Ask questions. Get the matter clear in your mind. Talk to your supervisor or someone in charge. If that doesn't help, the Business Ethics Committee will assist you. You can contact them by writing to Mail Station A16-GHQ, or by calling Ext. (111) 53810. Howard Dunn, vice president-Audit, is chairman of this group.

If something had started to slip, you will have helped us all. If everything is OK, you will have restored your confidence in the company.

In the times we live in, when not every organization has the integrity one would like it to have, it's important to realize that each one of us carries a portion of the responsibility for Grumman's good name. If we maintain the highest possible standards in our dealings with each other, our customers and our suppliers, our good reputation is safe, and Grumman will be stronger for it.



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Chairman

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